Ethnobotanical Notes on Gingers of the Huon Peninsula in Papua New Guinea

B.B. BAU[1] AND A.D. POULSEN[2]

[1]Papua New Guinea Forest Research Institute, P.O. Box 314, Lae 411 Morobe Province, Papua New Guinea
[2]Royal Botanic Garden, 20A Inverleith Row, Edinburgh EH3 5LR, Scotland

Abstract

Only few studies on useful gingers in Papua New Guinea have been published and we were only able to find information on two commonly used species. We conducted a 2-weeks preliminary study in the Huon Peninsula to document the species of gingers and their local names in the Kote language and their uses by the indigenous people. All species encountered were useful: four species of *Etlingera*, three species of *Amomum* and one species of *Zingiber*. It is recommended that further surveys should be conducted on gingers of Papua New Guinea to understand their taxonomy and ethnobotany in order to devise an appropriate ginger conservation program for the local communities.

Introduction

Papuasia, including Papua New Guinea (PNG), harbours approximately 8 native genera and 207 species of gingers (Zingiberaceae) as proposed by Hoft (1992). The family still needs to be thoroughly surveyed before the total species pool can be determined. With more than 800 language groups, PNG is at the same time culturally very diverse. Most of these groups have developed intricate people-to-plant associations including local names and uses for many plants. The uses of plants are still very important for the subsistence strategies employed by the people in many remote villages (Damas, 1998). Detailed ethnobotanical studies in Borneo have found that the ginger family (Zingiberaceae) includes numerous species useful to the local people (Christensen, 2002) and many of these may also be horticulturally important. It is likely that the people of PNG still maintain comprehensive ethnobotanical knowledge but it needs proper documentation as soon as possible before the information disappears

due to the increasing globalisation. The information on gingers and their traditional uses will be important in order to facilitate proper management and conservation strategies either *in situ* or *ex situ*.

Several papers and books have already been published on traditionally important plants of Papua New Guinea as medicines but had made less emphasis on other uses (Paijmans, 1976; Woodley, 1991). Only two gingers have so far been reported as being commonly used: *Amomum aculeatum* Roxb. and *Zingiber officinale* Roscoe (Holdsworth and Mahana, 1983), both of which are used against fever or influenza. The latter is also used throughout Papua New Guinea by the indigenous people to relieve cough (Holdsworth, 1977; Holdsworth and Damas, 1986).

Study Area

The study was conducted in November 2001 inland from Finschhafen on the Huon Peninsula at Jivevaneng Village (6°30'S 147°47'E) at 300–500 m above sea level and at Nanduo Village (6°26'S 147°40'E) at 600–700 m above sea level (Fig. 1.). Both of these villages are inhabited by people speaking the Kote language and have a patrilineal society (R. Banka, 2001, pers. comm.). The Finschhafen area has many coastal and inland villages that are separated by the rugged terrains comprising the Cromwell and the Saruwaged Ranges. The geological aspects of the topography are a major factor that makes the villages inaccessible to basic governmental services. Because of inaccessibility the people still rely largely on forest resources for their survival. The habitat surrounding the village includes old garden sites, and the degraded roadside areas are composed of common weeds species. More pristine forest is found a few kilometres away from the villages.

Materials and Method

The following standard methods were used for plant collecting. The vegetation was explored to locate the conspicuous leafy shoots of ginger. The search was subsequently intensified to find flowers and fruits. Photographs were taken of these before the rhizomes were dug up. This was done carefully to avoid breaking any attached inflorescences or infructescences. The specimens were collected in three sections: 1) the base with the rhizomes and flowers or fruits attached (if any), 2) the mid-section with 2–3 leaves, and 3) the top of the shoot with 4–5 leaves depending on size of leaf.

Interviews with guides from the nearby villages were conducted during the collecting and notes were taken on local names in the Kote language and uses. The collections were deposited at the Papua New Guinea

Figure 1. The study sites are situated approximately 100 km E of Lae in Morobe Province, Papua New Guinea. (Map courtesy Encarta Encyclopaedia of 1988–1997).

National Herbarium (LAE) with duplicates sent to the Royal Botanic Gardens, Kew (K) and University of Aarhus (AAU), Denmark.

Results

All collected species (eight) of gingers were found to have known uses by the Kote speaking villagers at the Huon Peninsula: four species from the genus *Etlingera*; three species from the genus *Amomum*, and one species from the genus *Zingiber*. Each species has one to four uses. The information from seven of these species is documented for the first time in the present paper, whereas the information on one species has already been published.

Description of species

Amomum aculeatum Roxb.
Material collected: *Bau et al. LAE 86303*, Jivevaneng, 9 Nov 2001 (LAE).
Vernacular name: *Asabareng*

Uses: 1) The pseudostem of young leafy shoot is beaten and the extracted juice is rubbed externally on the body and head and has a cooling effect in easing pain. 2) The fruits have a sweet taste and are eaten.
Description: Terrestrial herb to 2.5 m; rhizome thick; leafy shoots to 20 cm apart; base to 5 cm diam.; sheath brown at base - green at top, glabrous and shiny; ligule slightly bilobed; petiole 1.5 cm, base slightly purple; lamina obovate, plain green, pale green beneath, glabrous, midrib pale or white, apex acuminate, base ± oblique. Inflorescence radical, peduncle to 10 cm long; corolla lobes pale pink; labellum white with red lines in centre basally and yellow above; stamen white, anther crest with two extended wings. Infructescence globular; fruits dark purple, indehiscent; lobes extended above, with yellow lines to base. *Fig. 2.*
Habitat: ridge top near an old garden near village.

Figure 2. Inflorescence of *Amomum aculeatum* Roxb. This species has very juicy fruits when ripe and they are edible. Photo: A.D. Poulsen

***Amomum maximum* Roxb.**
Material collected: *Bau et al. LAE 86308*, Jivevaneng. 9 Nov 2001 (LAE).
Vernacular name: *Sâsiric*
Uses: 1) The inner part of the young leafy shoot is scraped and applied externally on the knee against aches. 2) The fruits are eaten by bandicoots and therefore the plant is grown as an attractant to facilitate hunting near the village.
Description: Terrestrial herb to 2 m; leafy shoots clumped; leafless to 1.3 m, leaves clustered at top, 8–10 leaves per shoot; base of leafy shoot 5 cm diam. gradually decreasing to 2 cm; sheath yellowish at base, pale green to the top; ligule membranous, bilobed, caducous; petiole 5 cm; lamina plicate,

plain green, dull pale beneath, pubescent, almost corrugated, base oblique. Inflorescence radical from rhizome; peduncle 6–11 cm long, bractless, pale green, bracts in spike not persistent. Flowers not seen. Infructescense, globular; fruits irregularly winged, immature, yellow-green, remnants of persistent calyx. *Fig. 3.*
Habitat: Common in old gardens near village at about 300 m elevation.

Figure 3. *Amomum maximum* Roxb. The fruits attract the bandicoots which is a desired game species. Thus the *A. maximum* is planted to make hunting easier. Photo: A.D. Poulsen

***Amomum* sp. 1**
Material collected: *Bau et al. LAE 86358*, Nanduo, 14 Nov 2001 (LAE).
Vernacular name: *Bareng-bafu*
Uses: The flesh inside the leafy shoot is scraped off, squeezed, strained and drunk to treat colds, flu, stomachache and headache.
Description: Terrestrial herb, 2.6–3.8 m tall, leafy shoot with 10–28 leaves, clumped; base of leafy shoot white; sheath green, glabrous, ligule bilobed pale green; petiole short; lamina to 45 x 8.5 cm, green, glabrous above, beneath pale green. Inflorescence radical, peduncle 10–12 cm long; calyx brown, persistent; corolla lobes pale yellow; labellum tunnel-shaped, yellow with red stripes forming into the corolla, apical lobe shorter than style; anther crest white. Infructescence green, immature seeds white. *Fig. 4.*
Habitat: Disturbed forest area near village.

Figure 4. *Amomum* sp. 1, rhizomes, fruits, flowers and leaves. The flesh of the leafy shoots are used to treat colds and flu, stomach ache and body ache. Photo: A.D. Poulsen

***Etlingera labellosa* (K. Schum.) R.M. Sm.**
Material collected: *Bau et al. LAE 86301*, Jivevaneng, 9 Nov 2001 (LAE).
Vernacular name: *Barengopo*
Uses: 1) Leaves are used to cover tubers of *Colocasia antiquorum* Schott when these are boiled in water with added oil to prepare a meal. 2) The beaten pseudostem (using hard sticks) is squeezed to extract juice, which is applied externally against body ache. 3) The twisted and beaten pseudostem is used for making climbing ropes. 4) Fruits are sweet and eaten.
Description: Terrestrial herb to 4 m; rhizome long-creeping; unpleasant smell of cabbage and soap when cut; scales on rhizome white or greenish brown when exposed; base of leafy shoot to 8 cm diam.; sheath green and glabrous; petiole 1.5–2.5 cm, green; lamina to 78 x 15 cm, plain green beneath; base unequal. Inflorescence radical from rhizome; peduncle 3–7 cm long, pale brown to white; calyx white to pale pink at apex; central lobe of labellum emarginate, lateral lobes pale red to white; filament white, anther white with central pink and pink at crest; stigma dark pink. Infructescence subterranean, with 1–2 fruits; fruit ca 2.5–3 cm diameter; densely covered by pale brown hairs. *Fig. 5*.
Habitat: Near forest trail in an old garden area near village.

Figure 5. The leafy shoots of *Etlingera labellosa* (K. Schum.) R.M. Sm. are used as climbing ropes for coconut trees. The flesh is also used to treat all kinds of body aches. Photo: A.D. Poulsen

***Etlingera* sp. 1**
Material collected: *Bau et al. LAE 86300*, Jivevaneng, 9 Nov 2001 (LAE).
Vernacular name: *Safanang*
Uses: The leaves are covered with the bark of *Paraserianthes falcataria* (L.) Nielsen and cooked over the fire; the cooked leaves produce a very strong aromatic smell and are worn as traditional decorations during *sing sings* (traditional dances) and folk celebrations.
Description: Terrestrial herb to 1.5 m; rhizome long-creeping, when cut with strong taste and smell of anis seed (*Pimpinella anisum* L.); base of leafy shoot to 2 cm diameter; sheath green, reticulate, not pubescent; ligule at least 5 mm, green; lamina plain green, young leaves reddish brown. Inflorescence from rhizome some distance from base; peduncle 2–8 cm long; bracts pale pink, calyx pale red, petals dark pinkish red; labellum pink; stamen pale pink; stigma white.
Habitat: The population was found near a bush track in an old garden area. It was growing amongst *Bambusa* sp. below several cultivated *Cocos nucifera* L.

***Etlingera* sp. 2**
Material collected: *Bau et al. LAE 86302*, Jivevaneng, 9 Nov 2001 (LAE).
Vernacular name: *Gamiong*
Uses: The fruits are chewed as a substitute for betel nut (*Areca catechu* L.).
Description: Terrestrial herb to 2.5 m; rhizome ± long-creeping, scales brown;

leafy shoot with c. 20 leaves; base of leafy shoot to 3 cm diam., brownish green; sheath reticulate, greenish brown, pubescent on cross-ribs; petiole 0.5 cm; lamina plain green. Young inflorescence pink, flower plain red, anther brown, stigma white. Smell of cut rhizome and crushed leaves faintly like *Etlingera elatior* (Jack) R.M. Sm.
Habitat: Old garden site near village.

***Etlingera* sp. 3**
Material collected: *Bau et al. LAE 86337*, Bembavaneng Hill, Nanduo, 14 Nov 2001 (LAE).
Vernacular name: *Zunzun*
Uses: 1) The fruit is chewed as betel nut (*Areca catechu* L.). 2) The stems and leaves are used to make small shelters to hide in when hunting bush fowls.
Description: Terrestrial herb 1–2 m; diameter 3 cm, rhizome 1 cm diameter, long creeping; scales reddish, sheath olive-green, reticulate; sheath purple at top; leaves plain green, glabrous above, pubescent below, young purplish brown below, inflorescence less than 5 cm long; flowers plain red; anther pale pink; stigma white.
Habitat: Forest near village.

***Zingiber zerumbet* (L.) Sm.**
Material collected: *Bau et al. LAE 86304*, Jivevaneng, 9 Nov 2001 (LAE).
Vernacular name: *Zazamang*
Uses: Ornamental plant in village and garden areas.
Description: Terrestrial herb to 1 m; rhizome thick and short, yellow in centre when cut; base of leafy shoot fleshy, reddish, to 2 cm; sheath purplish; ligule to 2 cm, membranous; petiole swollen; lamina plain green, soft, beneath pale green and puberulent. Inflorescence radical, to 20 cm long; bracts reddish. Flowers not seen.
Habitat: In a cluster below several planted *Cocos nucifera* L. trees along trail in village garden.

Discussion

The total species pool of the study area is no doubt larger than the eight species collected in the present study, but a more intensive survey would need to be conducted to document more species. This should include more focus on the dominant species in the old garden sites, which were poorly covered in our preliminary survey. Likewise, some common cultivated species like *Zingiber officinale* Roscoe were not sighted as the survey took place away from the most likely areas of its cultivation.

The uses of gingers in Papua New Guinea have, to date, been poorly documented, and the results of this preliminary survey indicates that the species have a wide range of uses from ethnic dressings in traditional dances (*sing sings)* to an alternative for betel nut chewing, and thus have a large potential.

Previous publications only highlighted the genera *Amomum* and *Zingiber* as useful to the villagers in the Huon Peninsula (Holdworth, 1977; Holdsworth and Damas, 1986; Holdsworth and Mahana, 1983; Paijmans, 1975; Peekel, 1984; Woodley, 1991). But this study also documents uses for the genus *Etlingera* which was found to have several uses. In the present paper, we are only able to give specific epithets for one species, because *Etlingera* is still poorly known in PNG and is still being revised for the Flora Malesiana by the second author.

In the present study, *Zingiber zerumbet* (L.) Sm. is only used as an ornamental plant but in Malaysia it is also used as medicine (Holttum, 1950; Burkill, 1966). In the Bismarck Archipelago, however, Peekel (1984) noted it to be 'less spicy' than *Z. caninum* Peekel and *Z. foliatum* Peekel but no specific notes of its edibility was presented.

Most of the useful species are common around the home gardens, which means that they are either cultivated to some degree or associated with the secondary forest vegetation. Also, in Borneo many gingers thrive in disturbed or human influenced vegetation (Christensen, 2002; Poulsen, 2006).

A more extensive survey of the gingers of Papua New Guinea commenced in Dec 2006 during which additional areas were visited to obtain more collections and ethnobotanical information. This will provide an essential basis for a comprehensive systematic treatment. Combined with ethnobotanical information this may be used to identify endangered and/or endemic species where particular conservation efforts have to be conducted. This will eventually contribute towards a more meaningful and constructive conservation avenue whether it is *in-situ* or *ex-situ*. Such a recommended conservation program should be community-based and economically attractive for the local villagers. The conservation program should be a source of income for the local people who will then be encouraged to propagate the wild seedlings in smaller nurseries for potential horticultural uses nationally and internationally.

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